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Acidosis and Alkalosis; Pit Cherries Against Arthritis; Carcinogenicity of Heated Fat; Disease and Thymus Gland; Vitamin K and Fractures; RNA Basic Secret; Dental Research

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The following is a transcription of the First Quarter 1972 issue of Dr. Royal Lee's *Applied Trophology* newsletter, originally published by Standard Process Laboratories.

Clinical Acidosis and Alkalosis

The blood pH is supposed to remain "practically constant" according to our best textbooks. The physician who starts to check his patients, however, does not concur. Instead of the *normal* figure of pH 7.3 to 7.5, he finds it varying from 7.2 to 7.8.[1]

The measurement of pH is attended with difficulty because blood readily loses C02 when exposed to the air and thereby rises in pH rapidly after it has been withdrawn. In two minutes, a rise of .2 may occur.[1] PH meters are available where the electrodes are built into a syringe so the pH may be read directly before the blood is exposed to air (*National Technical Laboratories, Pasadena, California*).

The importance of clinical pH tests was illustrated by the following report of a pharmacist. He had been supplying, for a number of months, a capsule formula of aspirin, caffeine, phenacetin, and ammonium chloride to an arthritic patient where the remedy had been successful in controlling arthritic pains. The capsule dispensed was a standard formula of a pharmaceutical house, with a specific catalog number. The patient returned two days after receiving a renewed supply of capsules, complaining that they were ineffective and different from the previously used kind. On checking the records, it was found that the original formula had been revised, and the supposedly unnecessary ammonium chloride had been omitted. On supplying capsules of ammonium chloride alone, the patient reported the usual successful results.

What was the biochemistry behind this? Simply that a high pH (high alkalinity) tends to throw calcium out of solution in the body fluids, and bursitis, arthritis, neuritis, lumbago, sciatica, and a host of other painful syndromes may develop as a consequence. Cheilosis may occur, and herpes simplex and other virus type diseases seem to become active. The low calcium bicarbonate in the body fluids appears to be responsible. Allergies become acute; the calcium deficiency aspect of allergic sensitivity is well known. (Here again we recall that calcium is not assimilated in an alkaline GI tract). Normal rates of wound healing are greatly reduced, ulcers tend to become static.

The alkalosis-correcting effect of ammonium chloride is of course due to its decomposition into ammonia and hydrochloric acid in the blood after absorption, where the ammonia becomes urea and the acid is available to reduce the pH. Calcium chloride seems to be a synergist. Ammonium chloride if used alone for too long a time increases calcium demand, no doubt by the conversion of other calcium forms in the blood to chloride.

Ammonium chloride is a natural constituent of gastric juice. Calcium chloride is a form of calcium found in arrowroot starch and in seawater (in combination with sodium chloride and trace minerals). Both of these materials are physiological agents, factors common to body biochemistry and not new and foreign substances to the physiological economy (as are synthetics and antibiotics).

Merck's Index, Fourth Edition, says that ammonium chloride is useful in the treatment of bronchial affections, hepatic congestion, pelvic cellulitis, muscular rheumatism, gout, sciatica, chronic glandular enlargement, hemicrania, senile gangrene, dysmenorrhea, and leucorrhea.

Calcium chloride is listed as useful in the treatment of hemorrhage, hemorrhagic endometritis, epistaxis, menorrhagia, erythema nodosum, tetanus, spasmophilia, blackwater fever, hay fever, asthma, hemophilia, albuminuria, nephritis, typhoid, coryza, tuberculosis, osteomalacia, scrofula, rachitis, arthritis, spasm of glottis, infant convulsions, urticaria, eczema, and pruritis, among others.

All these effects are no doubt in the main simply accomplished by correcting the unbalanced state of the buffers and mineral salts in the tissue fluids. Gout is mentioned as one situation where ammonium chloride may help. Recently it has been discovered that the juice of cherries contains some active agent effective in gout, with 4 to 6 ounces of the juice (preferably unsweetened, but may be the canned or cooked form) promoting relief within a few days with consistent improvement.

This is the first time that the possibility of gout being a deficiency disease has been suspected. We can say that the ingestion of sodium compounds is definitely aggravative. Gout patients should see that their diet contains a preponderance of potassium. Sodium can promote the precipitation of the gouty concretions of sodium urate in the tissues.

A very important aspect of alkalosis is the fact that the habitual use of milk of magnesia promotes the condition. It has also been reported to cause epistaxis, very specifically. You will be surprised to note how many of the patients who ask you for a remedy for nosebleed are using milk of magnesia as a laxative.

Citrus fruits being highly alkaline ash, with a high content of citric acid, need special attention. The first and immediate effect of ingestion of a few ounces of grapefruit or lemon juice is to lower the blood pH (acidify). The patient with alkalosis feels temporarily better. Later in the day, after the citric acid has been destroyed by oxidation as a fuel, the aggravation of the alkaline state becomes apparent.

The temporary effect of the citric acid is to cause calcium to be picked up—no doubt from the teeth or some bone reserves—and after the pH change, this calcium is deposited elsewhere in physiologically undesirable spots. The treatment of bursitis obviously becomes simple. No longer can X-ray treatment be recommended with equanimity. The physiological treatment would appear to be the preferred method.

Guanidine, a fatigue and tissue poison, and the end product of the breakdown of creatine, is the most potent organic alkaline substance known. It specifically precipitates calcium (recall that its diffusion from tired heart muscle into coronary vessels is the cause of precipitation therein of calcium). Guanidine is normally reconverted into creatine by the influence of the parathyroid hormone, with the assistance of the thyroid.[2] Blood guanidine levels rise eightfold after parathyroidectomy.[3]

We can see where the guanidine effect, as a fatigue poison, is contributory to the arthritis, sciatica, etc., the patient often telling us how fatigue aggravates his state of misfortune. Local inflammation, as well as toxins from constipation, also can release guanidine, its presence insuring a spastic state of blood vessels.

The thyroid hormone physiologically promotes the resorption and dissolution of protein structures that have reached the end of their physiological cycle (*a la* the theory of the dynamic state of living tissue, replaced and rebuilt at specific time intervals). That is why in children, thyroid deficiency is the cause of delayed development.

In the adult, a hyperactive thyroid again can cause toxicosis by promoting more tissue poisons than the eliminative system can tolerate. In old people, this may be a critical situation, thyroid sometimes becoming a violent poison —*only* because the normal synergists are not available to maintain the desirable complete cycle of activity.[5] The normal activity of the gland can be blocked by reason of a deficiency of polyunsaturated fatty acids.

We must also consider clinical acidosis. The effects of acidosis may be aggravated by a diabetic state where organic acids cannot be oxidized normally and instead must be combined with reserve alkaline salts and excreted.[5]

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Where sodium bicarbonate is administered to relieve diabetic acidosis, the urine should be watched and dosage stopped when a neutral urine pH is reached, according to this authority. Normally, blood glutamine provides ammonia for this purpose. Beet root and leaf are best vegetable sources of glutamine.

When an abnormal blood pH is found, it must be considered only as a sign that something is wrong. The symptoms may be entirely different with the same abnormal pH figure in different patients, in view of the fact that there are an infinite number of combinations of chemical situations that could alter pH—as many as there are different acids and alkalies.

The pH of the blood is a resultant of the forces acting upon it. The regulation of the blood C02 by the respiration control center of the brain is a major factor. The parathyroid, by eliminating the alkaline guanidine, and the kidney, by eliminating mineral salts (both acid and alkaline as may be required), no doubt exercise a supplementary control.

As a further point of clarification let us not be confused by the seeming acid effect of gastritis (heartburn) with its hydrochloric deficiency that virtually always exists here. When protein foods, for example, are consumed by a patient who is deficient in hydrochloric acid, the protein cannot properly digest and hence fermentation sets in. These acids of fermentation, then, are very irritating to the stomach lining and the esophagus, making the patient feel that he has hyperacidity.

To swallow an alkalizer at this point would give immediate relief but would obviously greatly aggravate the real problem. Not only are these irritating acids of fermentation neutralized but also what little hydrochloric acid might still exist in the stomach is neutralized— so that the next time food is put into the stomach, we have a double problem and a repeat of the previous symptoms. Whereas if the hydrochloric acid deficiency is recognized and accounted for, a cessation of the above symptoms is usually experienced.

Of course, a careful analysis of each of these patients needs to be considered, but we do want to emphasize that very often a deficiency of hydrochloric acid, with the results that follow, is not recognized as a deficiency, but instead is erroneously treated with chemical alkaline substances.

We might point out at this juncture that statistical records call our attention to the fact that as we grow older our hydrochloric acid production decreases. The average, reported in textbooks, estimates that at 65 we have approximately 15 percent the hydrochloric acid production we possessed in youth. Realizing these points will then alert us to recognize acid deficiencies as being a very common symptom in today's patient, who has been oriented to a diet largely of refined and processed foods. Needless to say, a patient who has lost his ability to properly and thoroughly digest proteins experiences not only protein starvation but also toxicosis from the protein putrefaction that invariably results.

The value of vinegar is more or less well known as an alternative of merit. Creatine is methyl-guanidine acetic acid, and the regeneration of guanidine into creatine requires acetic acid. In the toxemias of pregnancy guanidine is a critical factor. Vinegar is often craved by the patient, very logically it would seem. Cider vinegar being the preferred form, no doubt the malic acid of the apple is a factor, calcium malate being a catalyzer of polyphenol detoxification.[6]

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Pit Cherries Against Arthritis

Cheery note for sufferers from gout, gouty arthritis, and similar ailments is news that canned cherry juice apparently gives impressive relief in some cases.

First indication of possible medical value came in 1950, when the Texas Medical Society published an article giving case histories where cherry juice was used in treatment of gout. Since then, use of this Wisconsin beverage in Texas has increased substantially.

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Why Phyllis Quinn's Slow Cook Gourmet Is an SRP Fave

Some years ago, a number of Sturgeon Bay, Wisconsin, residents afflicted with arthritis cooperated in an experiment by drinking cherry juice daily. Resultant disappearance of stiffness and soreness in several instances was dramatic. A dentist found the juice helpful in treating pyorrhea.

To date, there is no definite scientific explanation as to how the juice helps relieve pain caused by diseases where improper balance of calcium is evident. One strong theory pinpoints pigment in cherries as the "relief mechanism."

The juice, known as "CheRefresh," has been canned since 1932 by Reynolds Bros., Inc., of Sturgeon Bay, Wisconsin. Process originally was developed with help of research department of American Can Company.

—*Food Processing*, April 1959

Carcinogenicity of Heated Fat

In an attempt to explain the high incidence of gastric carcinoma, Lane and Associates investigated the possible carcinogenic action of a common item of diet, heated fat. Roffo of Buenos Aires had already obtained papillomas of the forestomach and malignant tumors of the glandular stomach by feeding rats with fat preheated to 350°C. The authors fed browned lard, preheated to 350°C for 30 minutes, to 54 rats from Roffo's colony for 18 to 24 months.

Papillomas of the forestomach and ulcers of the glandular stomach occurred in 37 percent of these animals and in 5.7 percent of a control group fed unheated lard. These lesions usually occurred after an animal was 12 months old. No malignant tumors of the glandular stomach were produced. This may have been due to the fact that gastric carcinoma, according to Roffo, requires 22 months to develop and only 12 of Lane's animals lived that long.

Heated lard or vegetable oil was then injected subcutaneously in 31 rats, who were observed for 12 to 18 months. Three malignant sarcomas developed in this group, while none developed in a control group of 150 rats. Apparently lard heated to 350°C for 30 minutes contains a cancerogenic substance that acts subcutaneously in rats.

—*The Journal of the American Medical Association*, February 17, 1951, p. 514

Disease and the Thymus Gland

The body's defense against disease seems to originate in the thymus gland, and a spleen-thymus tissue culture destroys viruses, according to data gathered by Dr. Robert Auerbach of the University of Wisconsin. His experiments "strongly confirm" his earlier hypothesis that cells from the thymus migrate to the spleen at birth and become lymphoid cells, Dr. Auerbach told the 13th Annual Meeting of the Tissue Culture Association, held in Washington, DC. The destruction of viruses by spleen thymus tissue culture hasn't been proved to be an antibody mechanism, he adds, and current experiments are aimed at resolving the problem.

—*Chem. & Eng. News*, 40, 31, June 4, 1962

Vitamin K and Fractures

Bouckaert, J.H. (Clinic of Large Animals, State University, Ghent), and Said, A.H. "Fracture Healing by Vitamin K." *Nature*, 185, 849 (1960).

"Vitamin K (amount not stated) accelerated healing of fractures in rats and rabbits." *Nutrition Abstracts and Reviews*, Vol. 30, No. 4, October 1960.

RNA Basic Secret Revealed

American scientists have now worked out the structure of a nucleic acid. This breakthrough clears the way for similar determinations in other nucleic acids and a study of their role in heredity. Nucleic acids are nature's key to life. This substance helps direct the development of form and function of all living things. In fact, generations succeed each other because the nucleic acids determine the genetic code of all organisms, give the instructions as to which body parts are to be built, and then bring the necessary ingredients together to make the parts.

This scientific feat was accomplished by Dr. Robert W. Holley, professor of biochemistry at the College of Agriculture at Cornell University, Ithaca, New York, and a team of seven researchers who aided him in determining the exact construction of a nucleic acid.

Greater understanding of the nucleic acid complex may lead to new controls over disease and genetic defects, according to Dr. Holley in his original article in *Science*.

In a conference at Cornell Medical College, Dr. Holley advised that the accomplishment was the result of about nine years of work. The original project to isolate alanine transfer RNA from more than 50 others of the nucleic acid complex in baker's yeast took over three years. Transfer RNAs are the smallest known biologically active nucleic acids. It was necessary to break up the molecule into fragments that could be pieced together in the order of a linear jigsaw puzzle. Alanine is an RNA transfer found in all body protein. The breakdown was done in four steps as there are four types of nucleic acid in each body cell accounting for life.

Deoxyribonucleic acid carries the genetic code and is so impotent the cell protects it by using another nucleic acid (of different composition) to carry out the orders of the DNA. This job is done by the messenger RNA, which copies the message from the DNA code, then leaves to meet up with another nucleic acid called the ribosomal RNA. The ribosomal RNA serves as the gathering place for the messenger RNA and the other ingredients necessary to make proteins. Also waiting in the ribosomal RNA is the transfer RNA whose duty it is to read the message from the messenger RNA and then transfer this message to the amino acids.

There are some twenty amino acids and probably three different transfer that are specific for each, or approximately 60 transfer RNAs. In this breakthrough the scientists led by Dr. Holley used the transfer RNA specific for the amino acid alanine.

Essentially, it was a four-step process due to the four types of nucleic acid in each cell, accounting for life as elucidated above. The RNA molecule was digested into small fragments with an enzyme, and the chain of RNA was selectively cleared into subunits called nucleotides. All four of the nucleic acids are made up of nucleotides. After six years of work the scientists found that the alanine transfer RNA molecules consisted of 77 nucleotides. The task of breaking down the 77-part chain into identifiable parts took three years.

Dr. Holley remarked that once we understand the complete nucleic acids system we can manipulate genetic materials for a whole series of useful purposes. These may range from altering the nature of plants and animals, vital to human nutrition, to new ways of controlling DNA-linked diseases and genetic effects. DNA, or deoxyribonucleic acid, will however be much more difficult to break down, as the DNA molecule is larger and contains thousands of nucleotides. DNA ribonucleic acid is the genetic code of hereditary instructions that make every living organism the way it is.

In regard to this scientific achievement, Dr. William H. Allaway, director of USDA laboratory and professor of soil science at Cornell University, states, "The discovery by Dr. Holley and his associates may open the way to the development of new solutions to this critical nutritional problem. And it may provide a new basis for understanding many important living cells."

Dr. Wendell Stanley, noted Nobel Prize winner (for his feat of crystalizing the tobacco mosaic virus), said, "I believe that the elucidation of nucleic acid is the most important scientific problem we face today. It is vastly more important than any of the problems associated with the structure of the atom, for in nucleic acid we are dealing with life itself."

Dental Research Pinpoints Vitamin Deficiencies

Vitamin deficiency is not as rare in the U.S. as most public health officials would have us believe, two University of Alabama physicians say in a recent issue of the *Journal of Dental Medicine*. Drs. E. Cheraskin and W.M. Ringsdorf Jr. present evidence that there have been significant reductions in the nutrients available for human consumption. Because of this, "the American public may be suffering with some of the minimal gradations of nutritional deficiency states," the doctors point out.

Citing their work at the University's Department of Oral Medicine, the scientists report that many deficiencies are showing up in apparently healthy individuals. Although these people have no overt illness or disability, the physicians classify them as having suboptimal health or subclinical illness. "There is reason to believe that a large fraction of the population falls in this category," they add.

For example, well over 31 percent of 861 dental patients—presumably otherwise healthy—examined in the department of oral medicine were found to have unsatisfactory plasma vitamin C levels. The situation is similar for vitamin A and the multiple vitamin deficiencies, the doctors say. They cite numerous studies showing that multivitamin supplementation improved the performance of "healthy" subjects. "It seems safe to conclude that significant correlations may indeed exist between the need for vitamin supplementation and the early or incipient stages of disease," Drs. Cheraskin and Ringsdorf said.

The researchers drive home the point that more effort should be directed at detecting vitamin shortages. Because vitamin deficiencies do not result in visible illness, they have received only secondary emphasis in medical practice, they said. “More important, there is suggestive information that vitamins are necessary to the prevention of disease,” the doctors add.

A survey just being started by the U.S. Department of Agriculture could go a long way to initiate the type of research the Alabama researchers are recommending. USDA will undertake the first national survey of American eating habits in the last 10 years. According to Agriculture Secretary Orville Freeman, the study will “provide an appraisal of the nutrient adequacy of diets in the U.S. and be the basis for consumer educational programs.”

—*Health Bulletin*, January 16, 1965, Vol. 3 No. 3

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